

**Remarks/Arguments**

Examiner Shakeri is thanked for the thorough Office Action.

**In the Claims**

Claim 42 is amended to state: .. “ wherein said plurality of grooves have a semicircle profile along the entire length extending from said inner peripheral surface to said outer peripheral surface. “ For support see figure 3B. See specification p. 13, lines 7-8.

Claim 57 is amended to state “ plurality of grooves have a semicircle profile along the entire length extending from said inner peripheral surface to said outer peripheral surface. “ For support see figure 3B. See specification p. 13, lines 7-8.

Claims 60 and 61 are amended to provide proper antecedent basis for the “first groove”. See parent claim 55.

No new matter is added.

**EXAMPLES OF SOME NON-LIMITING EMBODIMENTS**

Applicant’s figure 3A shows a non-limiting example embodiment.

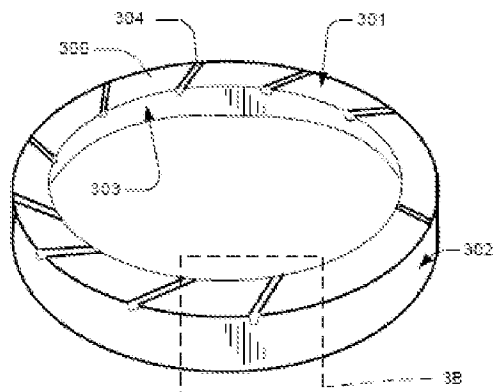


FIGURE 3A

Applicant's figure 3B shows an aspect of a non-limiting embodiment:

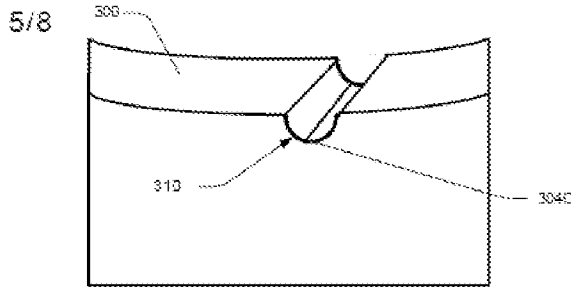


FIGURE 3B

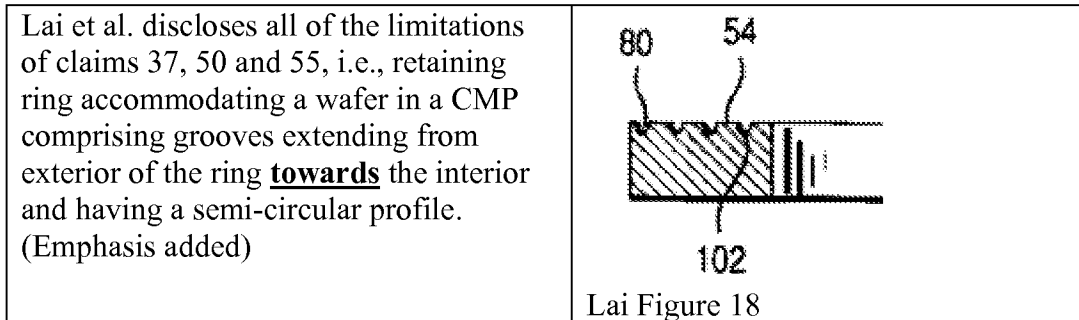
Rejection of Claims 37-42, 44, 46, 50-52, 54-57, 59 and 60 under 35 U.S.C. 102(b) as being clearly anticipated by Lai et al. (6,224,472).

The rejection of Claims 37-42, 44, 46, 50-52, 54-57, 59 and 60 under 35 U.S.C. 102(b) as being clearly anticipated by Lai et al. (6,224,472) is acknowledged. Reconsideration and withdrawal of the rejection is respectfully requested in view of the comments below.

Claim 37 states:

37. (PREVIOUSLY PRESENTED) A CMP retaining ring, comprising:  
an inner peripheral surface;  
an outer peripheral surface;  
a lower surface adapted to contact and depress an upper surface of a polishing pad during chemical mechanical polishing of a lower surface of a substrate;  
a plurality of grooves on said lower surface of said retaining ring; **said plurality of grooves extending from said inner peripheral surface to said outer peripheral surface;**  
said plurality of grooves are spaced apart;  
said plurality of grooves include at least a first groove and a second groove;  
at least a portion of said first groove has a rounded cross sectional contour or slanted cross sectional contour.

The instant Office Action on page 2 urges:



**US 6224,472 -Lai does not suggest all the limitations of claims 37, 50, and 55**

Applicant argues that a careful close reading of US 6224,472 –Lai reveals that Lai does not show or suggest all the limitations of claims 37, 50, and 55. At least one limitation that Lai does not meet or suggest is

Claim 37 states: - “a plurality of grooves on said lower surface of said retaining ring; **said plurality of grooves extending from said inner peripheral surface to said outer peripheral surface;** “

Parent claims 50 and 55 have similar non-obvious limitations. \

Lai figure 18 shows “dimples” 80 is a cross sectional view. As shown in top down view Lai figure 12, these dimples only extend across a portion of the Lai retaining ring. (see Lai col. 14, L 21-23;). Lai’s dimples 80 do not extend to either the inner peripheral surface of the ring or to the outer peripheral surface of the ring. See Lai figures 18 and 12. Therefore Lai does not meet or suggest applicant’s parent claims 37 50 and 55.

Lai col. 14, lines 21-23 state:

Examples of other possible configurations include, but are not limited to, dimpled surface characteristics made up of a plurality of dimples 80 as shown in FIG. 12 and FIG. 18

Lai col. 7, L 55-58 states:

FIG. 12 is a simplified perspective view of a CMP retaining ring having arcuate dimpled surface characteristics according to one embodiment of the disclosed method and apparatus.

.. Lai col. 8, L 16-29 state:

FIG. 18 is a simplified cross sectional view of the CMP retaining ring of FIG. 12.

Below are shown Lai figure 12 and figure 18 which shows the cross section of dimples 80 from top down figure 12.

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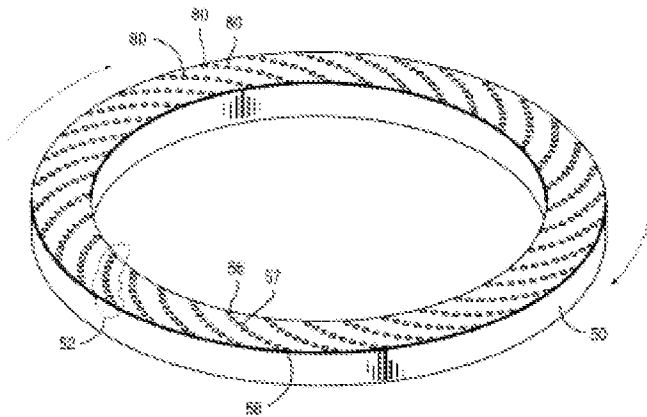


FIG. 12

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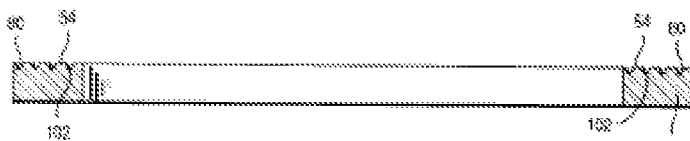


FIG. 18

Lai Figure 12 clearly shows the dimples 80 do not extend from the inner peripheral surface to the outer peripheral surface of the ring.

Lai does not suggest modifying the dimples shown in figures 12 and 18 to meet the applicants' claims. Lai teaches away from applicant's claimed grooves.

If there is another Office Action issued with this rejection, applicant's representative respectfully requests that the exact Lai col. and lines be cited as support for the rejection. I have responded to this Office Action based on the info in the instant Office Action which appears only showed Lai cross sectional figure 18. No citations or figure number or any other support appears to have been listed in the Office Action.

As shown above and read in Lai's specification, Lai does not show or suggest applicant's limitation in parent claims 37 50 and 55. Lai's other embodiment teach away from applicant's claims.

Therefore parent claims 37 50 and 55 are patentable over Lai.

**Claims 38-42, 44, 46, 51, 52, 54, 56, 57, 59 and 60 are not anticipated by Lai**

Claims 38-42, 44, 46, 51, 52, 54, 56, 57, 59 and 60 are not anticipated by Lai because Lai does not show or suggest the limitations of the parent claims as discussed above and does not show or suggest the limitations in the dependent claims 38-42, 44, 46, 51, 52, 54, 56, 57, 59 and 60.

The instant office action on page 2 argues:

Regarding claims 38-42, 44, 46, 51, 52, 54, 56, 57, 59 and 60, Lai et al. meets the limitations, e.g., grooves not intersecting; no annular grooves; linear grooves; radius of about 6.5 mm; and rounded bottom corners.

Claims 38-42, 44, 46, 51, 52, 54, 56, 57, 59 and 60 have many novel and obvious elements not in Lai. Some examples are:

claim 39 : ... said plurality of grooves **only communicate between said inner peripheral surface and said outer peripheral surface.**

claim 40 ... 40. (PREVIOUSLY PRESENTED) The CMP retaining ring of claim 37 wherein said plurality of grooves are linear; and **said plurality of grooves are uninterrupted extending from said inner peripheral surface to said outer peripheral surface;**  
said lower surface does not comprise an annular recess.

All claims that have a limitation that groove extend from the said inner peripheral surface to said outer peripheral surface are not anticipated by Lai.

**Amended dependent claims 42 and 57 are non-obvious**

Amended dependent claims 42 and 57 are non-obvious. These limitations are not shown or suggested by the combination of references.

Other claims have other non-anticipated limitations.

**CLAIM REJECTIONS - 35 USC 103**

**Rejection of Claims 43, 47, 53, 58 and 61 under 35 U.S.C. 103(a) as being unpatentable over Lai et al. in view of Taylor (6,869,335).**

The rejection of Claims 43, 47, 53, 58 and 61 under 35 U.S.C. 103(a) as being unpatentable over Lai et al. in view of Taylor (6,869,335) is acknowledged.

Reconsideration and withdrawal of the rejection is respectfully requested.

The Office Action p. 3 section 5 states:

Lai et al. meets all of the limitations of the above claims, except for disclosing a rounded top corner (corners contacting the pad).
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As discussed above, all parent claims are patentable over Lai. Therefore all dependent claims are patentable over Lai and any combination of references.

The OA states:

Taylor teaches that the corners of the grooves contacting the pad can be beveled or rounded. It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the invention Lai et al. with rounded top corners as taught by Taylor to avoid excessive wear of the pad (Taylor 05:32-34).

### **The Combination Of Lai And Taylor Is Improper**

First, the combination of Lai and Taylor is improper because it can only be done with hindsight. Also, neither patent suggest combination. Neither patent solves the same problems or the problem of the applications embodiments.

Claims 43, 47, 53, 58 and 61 depend from non-obvious parent claims are therefore non-obvious. Claims 43, 47, 53, 58 and 61 have further non-obvious limitations.

Rejection of Claims 45, and 49 under 35 U.S.C. 103(a) as being unpatentable over Lai et al. in view of Chen et al. (6,656,019).

The Rejection of Claims 45, and 49 under 35 U.S.C. 103(a) as being unpatentable over Lai et al. in view of Chen et al. (6,656,019) is acknowledged. Reconsideration and withdrawal of the rejection is respectfully requested.

The instant office action states:

Lai et al. meets all of the limitations of the above claims, except for disclosing a flat bottom and curved sidewall. Chen et al. teaches groove for delivering slurry of varying shapes. It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the invention of Lai et al. with different shapes, i.e., S3 as taught by Chen et al. to avoid accumulation of debris (Chen et al. 10:08-13).

Regarding curved and slanted sidewalls, Lai et al. as modified by Chen et al., meets all the limitations, and suggests that the grooves may be of any shaped situated for the particular application, and it is also noted that, it has been held that changing shape, dependent on workpiece parameters, involves only routine skill in the art. In re Stevens, 101 US PQ 284(CCPA1954), and further it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the sidewall curved to enhance prevention of accumulation, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Reference Chen et al. (US 6,656,019)

Chen shows a CMP pad having grooves. See (Abstract, see claim 1).  
Chen does not refer to “retaining ring” or “ring” anywhere in the patent.

Combination of Lai and Chen is improper

The combination of Lai and Chen is improper because Lai involves retaining rings and Chen involves CMP pads. Second, the combination could only be done using hindsight. Third, the patent solve different problems and both solve different problems that the applicant’s claims. Fourth, if it was obvious, the applicant’s claims would have been done before. CMP retaining ring art is very crowded and old. Yet no reference suggest the combination or the applicant’s claims.

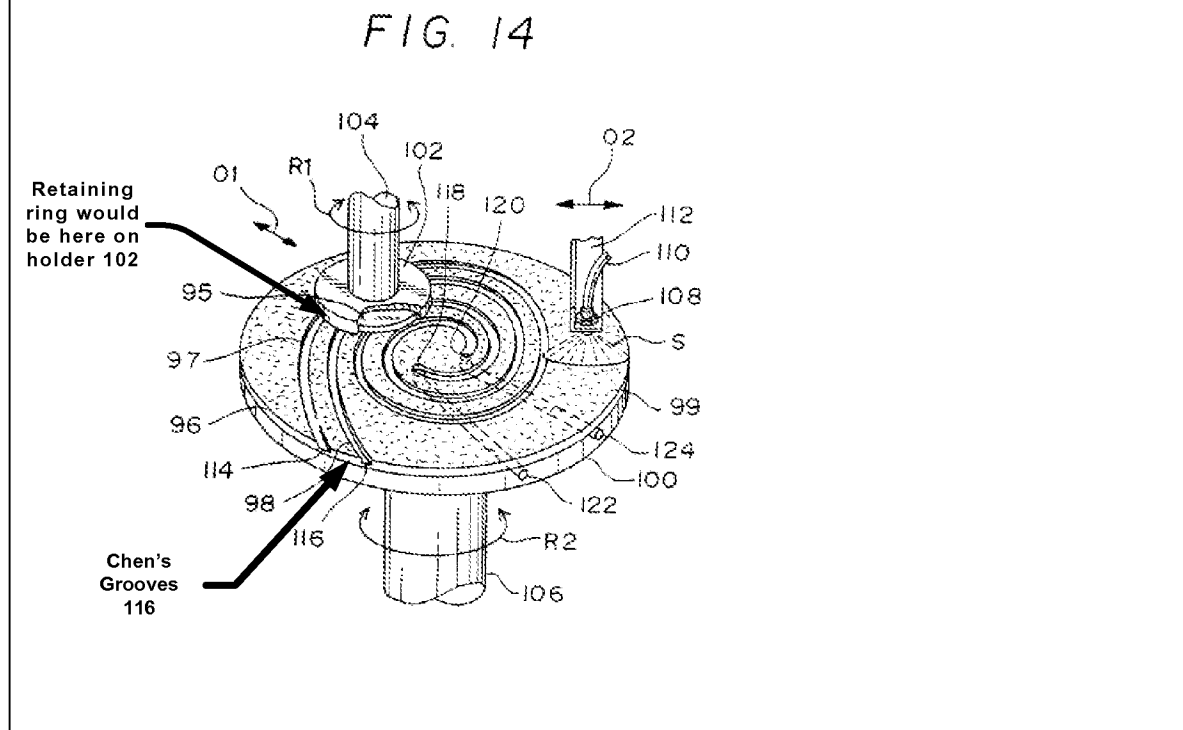
Applicant respectfully posits that this is a misinterpretation of Chen (Chen et at. 10:08-13). Chen shows merely grooves in a CMP pad. No where in Chen does discuss



retaining rings. Chen makes no suggestion to put grooves in retaining rings. Moreover, Chen figure 14 teaches against putting grooves into retaining rings by showing a cut away view of a CMP holder 102 that does not have any grooves in the surface that contacts the CMP pad.

Chen (Marked up) figure 14 clearly shows Chen's grooves are in the CMP pad, not in a retaining ring.

Fig 14 has added text labels added by the attorney



Furthermore, Chen figure 13, and especially the Chen (10:08-14), clearly point out the grooves are in the CMP pad. Figure 13 shows merely grooves in a CMP pad.

The dependent claims depend from non-obvious patent claims as discussed above.

Therefore, the applicants' parent claims are non-obvious over the combo of Lai and Chen et al.

The rejection of Claim 48 under 35 U.S.C. 103(a) as being unpatentable over Lai et al. in view of Chen et al. and Taylor.

The rejection of Claim 48 under 35 U.S.C. 103(a) as being unpatentable over Lai et al. in view of Chen et al. and Taylor is acknowledged. Reconsideration and withdrawal of the rejection is respectfully requested,

The instant Office Action states:

Lai et al. as modified by Chen et al. and Taylor in sections 5 and 6 meets all of the limitations of claim 48, modifications to avoid excessive wear of the pad (Taylor 05:32-34) and debris accumulation.

Claim 48 states

48. (PREVIOUSLY PRESENTED) The CMP retaining ring of claim 37 wherein said first groove has vertical sidewalls and an about horizontal bottom and at least one rounded corner between said sidewalls and said horizontal bottom; and rounded top corners near the lower surface of said ring.

As discussed above, the combination of Lai and Taylor is improper. The modification of Lai's dimples with the (Taylor 05:32-34) info to meet claim 48 is non-obvious without hindsight. No where does Taylor suggest or show claim 48's limitations.

Claim 48 depends from a non-obvious parent claim 37 as discussed above. Claim 48 has further non-obvious limitations.

Address all pending claims

It is believed that all the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or

concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper. and the amendment of any claim does not necessarily signify concession of the unpatentability of the claim prior to its amendment.

### **CONCLUSION**

In conclusion, reconsideration and withdrawal of the rejections are respectfully requested. Allowance of all claims is requested. Issuance of the application is requested.

It is requested that the Examiner telephone the undersigned attorney at (215) 670-2455 should there be anyway that we could help to place this Application in condition for Allowance.

### **Charge to Deposit Account**

The commissioner is hereby authorized to apply any fees or credits in this case, which are not already covered by check or credit card, to Deposit Account No. 502018 referencing this attorney docket. The Commissioner is also authorized to charge any additional fee under 37 CFR §1.16 and 1.17 to this Deposit Account.

Respectfully submitted,

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